

Physiology of Systems

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Respiratory System

The primary function of the Respiratory System is to supply the blood with oxygen in order for the blood to deliver oxygen to all parts of the body. The respiratory system does this through breathing. When we breathe we inhale oxygen and exhale carbon dioxide. This exchange of gases is the respiratory system's means of getting oxygen.

Respiration is achieved through the mouth, nose, trachea, lungs and diaphragm. Oxygen enters the respiratory system through the mouth and the nose. The oxygen then passes the larynx and the trachea which is a tube that enters the chest. In the chest cavity, the trachea splits into two smaller tubes called the bronchi. Each bronchus divides again forming the bronchial tubes. The bronchial tubes lead directly into the lungs where they divide into many smaller tubes which connect to the sacs called the alveoli. These are air-filled sacs that are surrounded by capillaries. The inhaled oxygen passes into the alveoli and then diffuses through the capillaries into the arterial blood. The waste-rich blood from the veins releases its carbon dioxide into the alveoli. The carbon dioxide follows the same path out of the lungs when you exhale.

The diaphragm's job is to help pump the carbon dioxide out of the lungs and pull the oxygen into the lungs. The diaphragm is a sheet of muscles across that lie across the bottom of the chest. As the diaphragm contracts and relaxes, breathing takes place. When the diaphragm contracts oxygen is pulled into the lungs. When the diaphragm relaxes carbon dioxide is pumped out of the lungs.

The Renal System

The system has two functions;

- To remove waste (urea)
- Control of level of water, this is osmoregulation

Urea is made in the liver. The liver uses a complex series of reactions called the ornithine cycle, to build up Urea. Urea can then be safely passed out of the body. Any imbalances or unusual chemicals in the body show up in urine such as;

- Drugs
- Pregnancy
- Sugar, which indicates diabetes
- Proteins, which indicate kidney damage.

The Nervous System

The brain is at the top of the nervous system. It is protected by the skull. The spinal cord is a very thick nerve. It hangs down from the brain through the hollow middle of the back bone. Millions of nerves branch from the central nervous system. They carry messages called nerve impulses around the body. Together the brain and the spinal cord are called the central nervous system.

How the nervous system works

1. A stimulated sense organ sends nerve impulses along the sensory nerve fibres to the central nervous system.
2. The central nervous system works out the best responses to the stimulus. Then it sends impulses to the muscles and the glands which will carry out the response.
3. The impulses travel to the muscles and glands along the motor nerve fibres.

Reflex and Voluntary actions

Reflex actions are actions you do without thinking to protect yourself for example coughing which clears the windpipe. Voluntary actions are actions which need thought like talking.

The Endocrine system

The Endocrine system consists of glands that release hormones into the blood. Hormones are produced chemicals in glands to travel in the blood stream to another organ to change the way it works. The organ where the hormone has an effect is called the target organ.

The Cardiovascular System

The cardiovascular system and respiratory system work together to circulate oxygen and remove carbon dioxide from the body.